ABSTRACT

Metal line structures in semiconductor devices and methods of forming the same are disclosed. A disclosed method for forming a metal line structure on a substrate includes: forming first metal lines, the first metal lines having a first barrier metal layer and a first conductive layer; forming a first interlayer insulator on the substrate and the first metal lines; planarizing the first interlayer insulator by removing a part of the first interlayer insulator to expose a top surfaces of the first metal lines; forming a second interlayer insulator on the first interlayer insulator and the first metal lines; selectively etching the second interlayer insulator to expose top surfaces of the first metal lines; sequentially forming a second barrier metal layer and a second conductive layer on the etched second interlayer insulator and the first metal lines; and planarizing the second conductive layer and the second barrier metal layer to expose top surfaces of the second interlayer insulator, thereby forming second metal lines comprising a portion of the second barrier metal layer and a portion of the second conductive layer.